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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/054,438 | 01/22/2002 | Gregory D. U'ren | 00CON134P-DIV | 7270 |

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EXAMINER

PHAM, LONG

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------|--------------------------------------|--|--|
| Advisory Action | Application No. 10/054,438 | Applicant(s) U'REN, GREGORY D. | |
| | Examiner Long Pham | Art Unit 2814 | |

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 28 June 2004 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) ☐ they raise the issue of new matter (see Note below);
 - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____.

3. ☒ Applicant's reply has overcome the following rejection(s): 112 rejections of claims 26 and 43.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: see attached office action.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: 23 and 41.

Claim(s) rejected: 18-22, 24-40, and 42-45.

Claim(s) withdrawn from consideration: _____.

8. ☐ The drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.
10. ☐ Other: _____

Long Pham
Primary Examiner
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DETAILED ACTION

Response to Amendment after final or Advisory Action

Status of the amendment after final rejection

The amendment after final filed 06/28/04 has been entered.

Status of the pending claims after final rejection

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 18, 19, 20, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 18, AAPA teaches a structure comprising:

a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and

a base contact comprising polysilicon. see pages 2-5;

AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Note that the processing limitations recited in structure claim 18 have been given no weight in the determination of patentability of claim 18.

With respect to claims 19-22, the processing limitations recited in structure claims 19-22 have been given no weight in the determination of patentability of claims 19-22.

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 24, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

4. Claims 25, 27, 28, 29, 30, 31, 32, 33, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claims 25, AAPA teaches a structure for forming a heterojunction bipolar transistor comprising:
a single crystal region situated over a first area. see pages 2-5 of the specification of this application; and
a polysilicon region situated over a second area.

With respect to claim 28, AAPA further teaches that the single crystal region comprises of silicon-germanium and the polysilicon region comprises polysilicon silicon-germanium.

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With respect to claim 29, AAPA further teaches that the single crystal region or base is in contact in the polysilicon silicon-germanium or base contact.

With respect to claim 30, AAPA further teaches that the single crystal region is a base in a heterojunction bipolar transistor.

With respect to claim 31, AAPA further teaches that the polysilicon region is The processing limitations recited in structure claims 25, 27, and 32-35 have been given no weight in the determination of patentability of claims 25, 27, and 32-35.

5. Claims 36, 37-40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 36, AAPA teaches a structure comprising:

a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and

a base contact comprising polysilicon. see pages 2-5;

AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Note that the processing limitations recited in structure claim 36 have been given no weight in the determination of patentability of claim 36.

Note that the processing limitations recited in structure claims 37-40 have been given no weight in the determination of patentability of claims 37-40.

6. Claims 42, 43, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 42, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claim 45, the use of polysilicon as emitter material is well-known to one of ordinary skill in the art of making semiconductor devices.

With respect to amended claim 43, it is well-known that a base contact is located over base region.

Response to Arguments

7. Applicant's arguments filed 06/28/04 have been fully considered but they are not persuasive. See below.

In response to the applicant's various arguments on pages 8-10 of the applicant's response dated 06/28/04, it is submitted that the process limitations recited in present device claims do not carry weight in the determination of the patentability of the present device claims. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

In response to the applicant's arguments in the first full paragraph on page 11 of the applicant's response dated 06/28/04, it is submitted that the present

disclosure does not show any unexpected results for claimed range of contact resistance. The present disclosure simply shows the common desire for low contact resistance.

Any official notices taken by the examiner in the rejections that are not challenged subsequently are assumed to be valid.

Allowable Subject Matter

8. Claims 23 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Long Pham

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Primary Examiner

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LP